

February 28, 1884.

THE PRESIDENT in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

- I. "On the Structure and Functional Significance of the Human *Corpus callosum*." By Professor D. J. HAMILTON. Communicated by Professor HUXLEY, P.R.S. Received February 23, 1884.

*Summary.*

1. The results have been obtained by a special mode of preparation formerly described by me.

2. The fibres in the tip of the frontal lobe run almost directly backwards. A short way behind this they become concentrated in an oval shaped area. This oval shaped area still further back divides into three distinct bundles, and these bundles I have named the *tractus internus*, *tractus medius*, and *tractus externus*.

3. The *tractus internus* becomes the corpus callosum and contains two sets of fibres, namely, (*a*) those coming from the opposite frontal lobe across the corpus callosum, and (*b*) those going from the frontal lobe of the same side. The fibres which come from the opposite frontal lobe anteriorly do not, after crossing in the corpus callosum, proceed to a corresponding situation on the other side, but, after arching forwards, so as to circumvent the anterior horn of the lateral ventricle and the head of the caudate nucleus, turn back to form the *tractus medius* and *externus*.

4. The *tractus externus* further back divides into the "inner" and "outer capsules," while the *tractus medius* joins with the inner capsule shortly after it is given off from the *tractus externus*. The fibres so derived from the frontal lobe of the opposite side are conducted along with the common fibres of the "inner capsule" to the following destinations. Some of them (a very few twigs) end in the head of the caudate nucleus, while the bulk of them are destined to become attached to the thalamus opticus. One large mass derived

from this source is the anterior peduncle of the optic thalamus. (Vorderer Stiel, Meynert.)

5. The callosal fibres derived from other regions of the cortex pursue a similar course:—They sweep downwards into the corpus callosum, slant somewhat backwards or forwards when they enter it, pass over to the opposite side, and then instead of becoming attached to a corresponding part of the cortex in the opposite hemisphere, turn upwards, outwards, and downwards, in a dense well-marked arch, and enter the inner and outer capsules. This mass of arched fibres I propose to name the *crossed callosal tract*.

6. The fibres of the opposite hemisphere, having thus become united to the inner and outer capsules, terminate in the following manner:—A few of them enter the head of the caudate nucleus, but by far the greater number become attached to the thalamus opticus opposite the bend or knee formed by the junction of the anterior and posterior divisions of the inner capsule. Those entering the outer capsule become attached respectively, from before backwards, with the following parts: the inner capsule, the olfactory tract, the temporo-sphenoidal lobe, and the optic tract. The olfactory and optic nerves are thus, I believe, connected directly with the cerebral cortex.

7. The corpus callosum, therefore, is not an interhemispheric commissure at all, but is the decussation of the cortical fibres in their progress downwards to become connected with the basal ganglia.

In the human brain I have never seen any fibres which pass directly from one hemisphere to another.

8. The “corona radiata,” as usually described, does not exist. The only fibres which pass from the cerebral peduncle directly up to the cortex of the same side are contained in the posterior division of the inner capsule. They correspond to those fibres which have decussated already in the anterior pyramids, and are a mere fraction of the whole “inner capsule” fibres. All the other fibres of the “inner capsule” pass into the *crossed callosal tract*, and, instead of running directly up to the cortex of the same side, cross in the corpus callosum to the cortex of the opposite side.

9. The same arrangement prevails in the callosal fibres from the tip of the frontal to the tip of the occipital lobes.

10. The *crossed callosal tract* comes so near to the cortex of the opposite side in arching downwards that injuries or stimulations of one side of the brain would be liable to affect the fibres coming from the opposite, and hence to produce a misleading result.